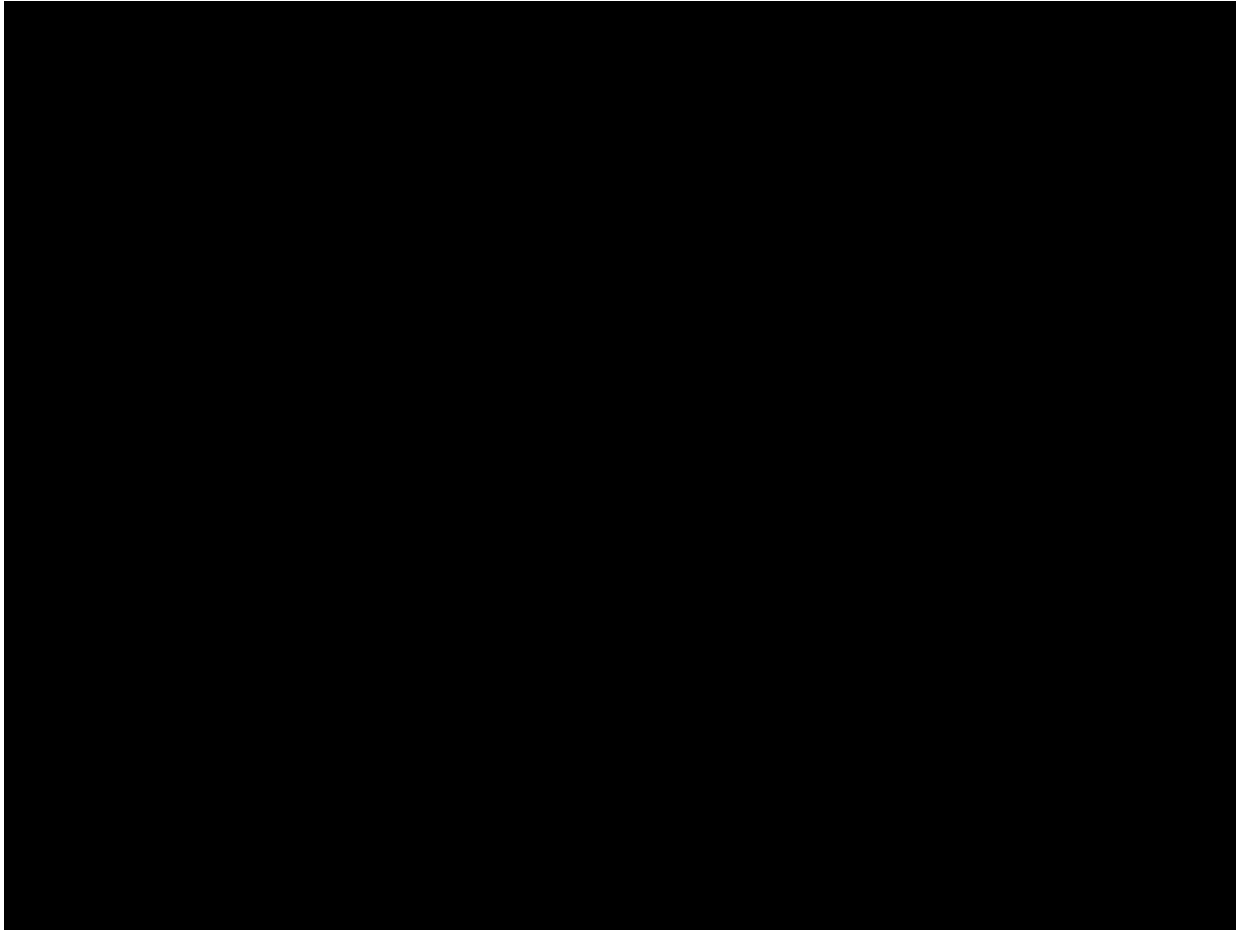


# **International Workshop on EUV and Soft X-Ray Sources UCD**

**Aisling McEvoy  
Science Foundation Ireland**





# Science Foundation Ireland (SFI)



- **Established in 2000 (first awards made in 2001)**
- **SFI's budget is received from the**  
*Department of Jobs, Enterprise and Innovation*
- **We have invested €1.4 billion since our first grants in 2001 - €300 million of that is currently 'live'**

## SFI Mission

**To build and strengthen scientific & engineering research & its infrastructure in the areas of greatest strategic value to Ireland's long-term competitiveness & development**



# Why Science Foundation Ireland (SFI) was created



***Pre 1990s:*** Science isolated from Government Policies

***Early 90s:*** Reports concluded that Science & Technology (S&T) should be at the heart of Industrial Policy

***Late 90s:*** First ever Government White Paper on S&T drawn up

The Technology Foresight exercise concluded that the Irish economy should be repositioned, towards .... **a knowledge-based economy**

The areas of **ICT** and **biotechnology** were identified as priorities, requiring new skills and in particular the development of a cadre of world class S&T personnel. **Energy** was added in 2008.

Our annual budget is approx. €160M

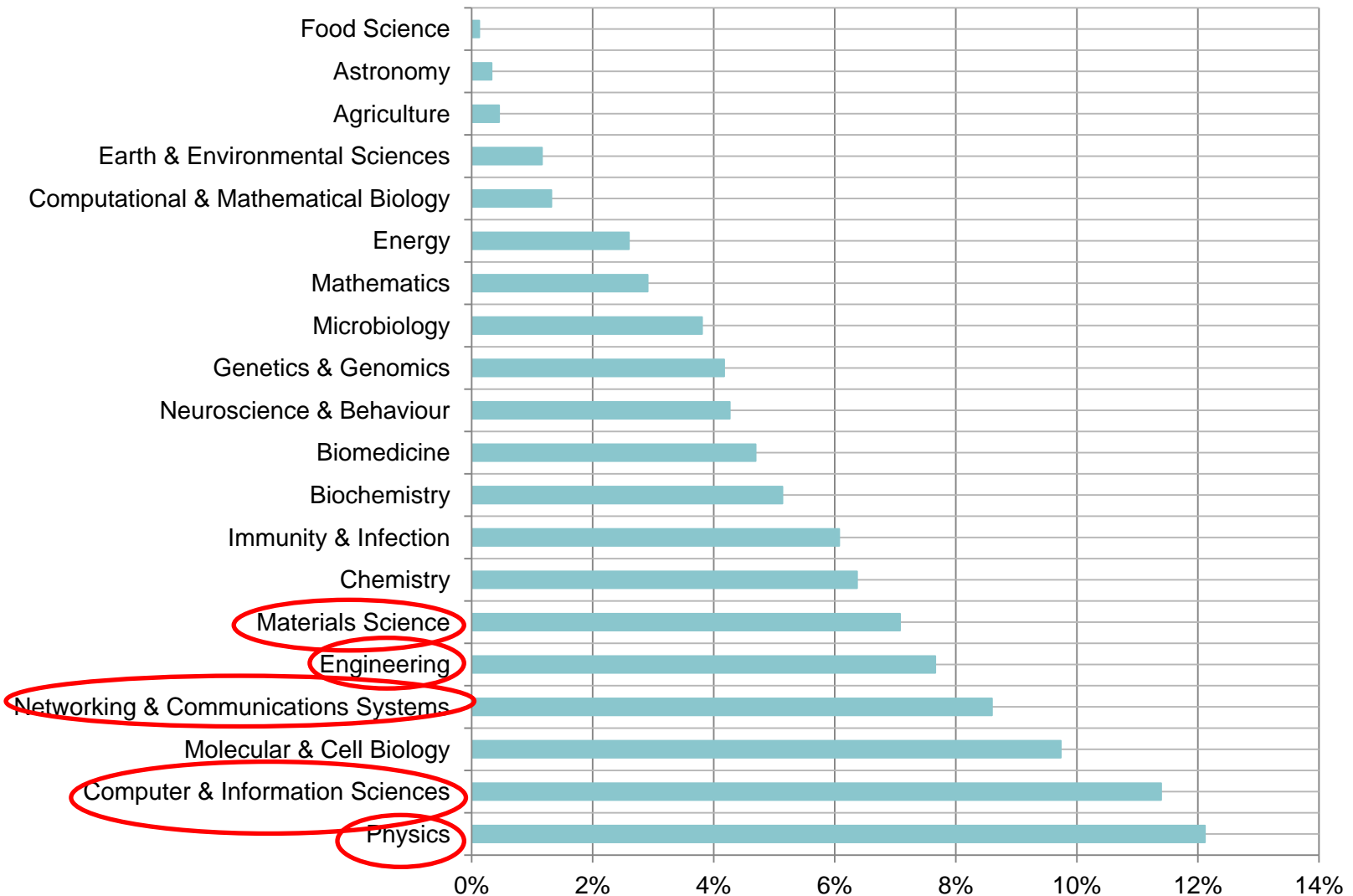


# SFI Structure

- **National foundation for scientific research in Ireland**
- **Currently under interim leadership (Dr. Graham Love), and advised by the SFI Board, comprises scientists, industrialists, and policy makers**
- **Two Directorates: ICET (Information, Communication and Emergent Technologies) and Life Sciences. Energy (Sustainable Energy and Energy Efficient Technologies) fits under both**
- **~ 50 staff of which 13 are Scientific Programme Managers**
- **Annual budget approx. €160M**



# PERCENTAGE EXPENDITURE BY DISCIPLINE/RESEARCH AREA



# What has SFI achieved?



- **Built a credible base of world class research teams** (~**3000** researchers, **463** award holders, **1251** PhD students; **781** postdoctoral researchers,...)
- **Helped drive Irish universities up the world rankings**
- **Driven up quality of Ireland's scientific research**



THOMSON REUTERS

Now in Top 20 (up from 36 in 2003) overall according to Thomson Reuters international rankings - # 8 Materials Science, # 3 Immunology

Almost 5000 peer reviewed publications in 2010

- **Internationalisation of Irish research** – collaborating with **56** countries
- **Created a high level of Intellectual Property**
  - Patents (66 filed, 10 awarded), licenses (28 granted) and spin outs (5)
- **An entirely new model of collaboration between industry & academia**
  - 800 linkages across 500 companies e.g. Intel, HP, Cisco, Sigmoid, SolarPrint etc.
- **ca. 2250** academic-academic collaborations (**44%** outside EU; **24%** within Ire)
- Assist **IDA/EI** in anchoring & transforming the industrial base



# Science Foundation Ireland (SFI)



How have we achieved this?

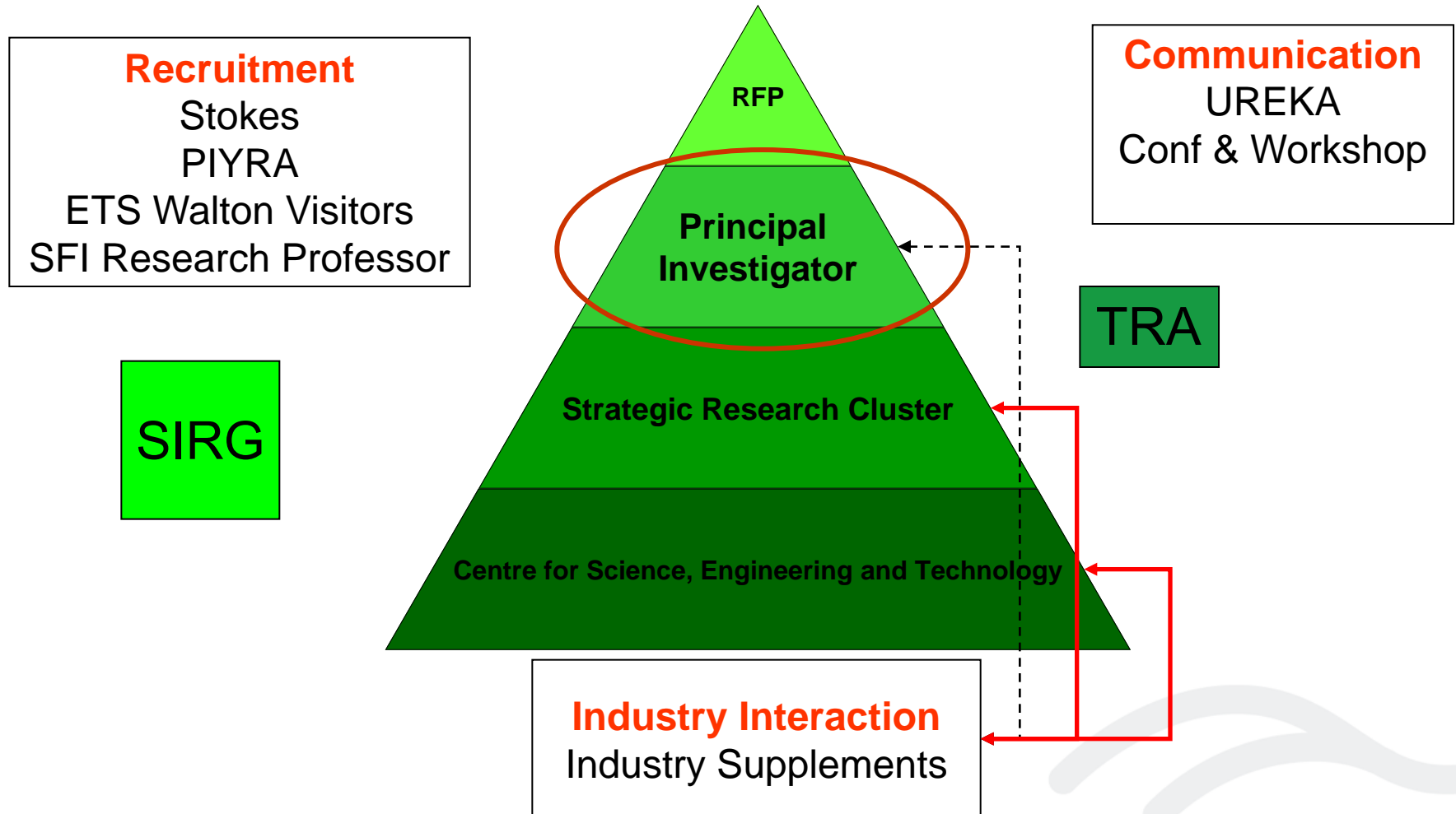
SFI funds outstanding people with innovative ideas and strategic partnerships by financing competitive research proposals

- Ensuring Quality/Excellence both of the person and of the proposed programme via International Peer Review
- Strategically important to Ireland but reviewers comment on global impact
- “Research with consequences”





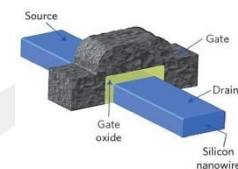
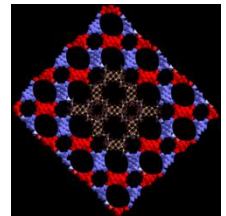
# Suite of SFI Awards



# SFI Principal Investigator Programme



- Grants may range from **€100,000 to €500,000 direct costs per year** and may be **3 to 5 years duration**
- As of October 2011: **191 active PI awards**
- Main SFI programme that **focuses on developing and enhancing internationally competitive research talent and excellence in Ireland**
- A selection of **PI awardees**:
  - Prof. Chris Dainty (NUIG) – applied/adaptive optics and vision science
  - Prof. JP Colinge (Tyndall/UCC) – semiconductor nanowire transistors
  - Prof. Liam Barry (DCU) – wavelength tuneable lasers
  - Dr. Brian Vohnsen (UCD) – adaptive photonics for nanoscale bioimaging
  - Dr. Wolfgang Schmitt (TCD) – supramolecular coordination networks for gas storage
  - Prof. Stephen Fahy (UCC) – materials and charge transport in meso-scale sc devices
  - Profs. O'Dowd & Leen (UL) – materials for energy
  - Prof. Vala (NUIM) – quantum information



Schematic of an n-type nanowire transistor.  
(Courtesy: *Nature Nanotechnology*)

# Strategic Research Clusters (SRCs)

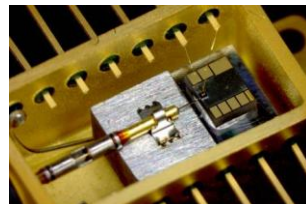
- To support the **clustering of internationally competitive researchers from academia and industry**, particularly Irish-based industry, to carry out **joint research activities** in areas essential to the development and competitiveness of Ireland's industrial and commercial base
- To enable these clusters **to attract and cultivate strong industry partnerships** that can inform and enhance their research programmes
- To **build interdisciplinary links** among researchers
- Funding – up to €7.5 million for 5 years (3+2) with 25% cost share requirement for years 4 and 5.



# Strategic Research Clusters

19 SRCs funded – 8 ICET + 1 Energy

<b>Information and Communication Technology for Sustainable and Optimised Building Operation (ITOBO)</b> , Prof Karsten Menzel, UCC
<b>Photonics – Integration “From Atoms to Systems” (PiFAS)</b> , Dr Frank Peters, Tyndall NI
<b>FORME - Functional Oxides and Related Materials for Electronics</b> , Prof Martyn E. Pemble Tyndall
<b>Strategic Research in Advanced Geotechnologies (StratAG)</b> , Prof Stewart Fotheringham, NUIM
<b>Federated, Autonomic Management of End-to-end Communication Services (FAME SRC)</b> , Dr Willie Donnelly, WIT
<b>Precision SRC</b> , Prof. Miles Turner, DCU
<b>Clique SRC</b> , Prof. Pdraig Cuningham, UCD
<b>Financial Mathematics Computation Cluster, FMC2</b> , Prof Tony Brabazon.



High speed laser packaged in collaboration with Eblana Photonics.



Tunable laser packaged in collaboration with Intune Networks.

# Centres for Science, Engineering and Technology (CSET)



**The SFI Centres for Science, Engineering & Technology (CSETs) are:**

- **major collaborative, often multidisciplinary, centres for excellence.**
- **funding is up to €25m over 5 years with a 25% cost share from industry.**
- **New partners (industrial and academic) may join a CSET at any time.**
- **SFI currently supports 9 CSETs.**

**SFI CSETs help link scientists and engineers in partnerships across academia and industry to address crucial research questions, foster the development of new and existing Irish-based technology companies, attract industry that could make an important contribution to Ireland and its economy, and expand educational and career opportunities in Ireland in science and engineering.**



## SFI CSETs



**Systems Biology Ireland, UCD**



**APC - Alimentary Pharmabiotic Centre, UCC**



**BDI - Biomedical Diagnostics, DCU**



**DERI – Web Science, NUIG**



**Lero - Software Engineering, UL**



**CNGL – Localisation Technologies, DCU**



**CLARITY – Sensor Web, UCD**



**CRANN – Nanoscience and technology, TCD**



**CTVR - Telecommunications, TCD**

# SFI Investing in EUV and Plasmas

- Since 2002, SFI has committed in excess of **€5.8M** to investigators working in the area of EUV lithography and related research into plasmas
- Includes **2 PI**, and **9 RFP** awards at University College Dublin, Dublin City University and Trinity College Dublin
- Current active areas of funded investigation include:
  - *Source Optimisation for EUV Lithography in High-Volume Manufacturing*
  - *Coincidence Photoelectron Spectroscopy*
  - *Investigation of Radiative Energy Losses from Tungsten Plasmas*
  - *Resonantly Enhanced High Harmonic Generation from Laser Plasmas*
  - *Magnetohydrodynamic Control of Laser-Produced Plasmas*

- **SFI is pleased to provide funds to advance Ireland's efforts in EUV-based technology**
- **Thank you for your attention and I hope you enjoy the rest of the meeting and your stay in Ireland.**

